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RESEARCH ARTICLE

TO STUDY THE VISUAL OUTCOME AND IOP CHANGES AFTER Nd: YAG LASER CAPSULOTOMY

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Abstract

Aims and objectives : To study the Visual outcome and IOP changes after Nd YAG Laser Capsulotomy in patients with posterior capsular opacity. To study the age and sex distribution. To study intra and post laser complications of Nd YAG Laser Capsulotomy.

Materials and Methods: This was a Prospective interventional study done on 100 eyes of 100 Post Cataract surgery patients who are having PCO attending to OPD of Ophthalmology department, Dr. R.S.P.R Government Regional eye hospital, Andhra Medical College, Visakhapatnam from August 2021 to August 2022. Relevant detailed History and Ocular examination was done.

Results: Majority of the patients are in the age group of 51-60yrs(36%). Females (54%) are more than Males(46%). Fibrous type is seen in majority of cases(45%). The mean IOP is more at 2hrs post Laser treatment. 1- 5 mmHg rise is seen in majority of cases(70%). 85% of patients showed best corrected visual acuity better than 6/18. 15% patients showed visual acuity less than 6/24. Elevation of IOP (>4 mm of hg) is the most common complication (46%) and Pitting of IOL (5%) after Nd: YAG Laser Capsulotomy.

Conclusion: Visual improvement is excellent after Nd: YAG Laser Capsulotomy. Transient rise of IOP is the most common complication. Even though transient, it may be detrimental to the health of the optic nerve head. So a careful monitoring of IOP before and after Nd:YAG Laser Capsulotomy is very much needed.

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Introduction:-

Posterior Capsular Opacification is the most common delayed complication after cataract surgery. This is due to migration and proliferation of residual lens epithelial cells (LECs) onto the Posterior capsule, leading to decrease in visual acuity [1]. Other symptoms associated with PCO are similar to symptoms of Cataract. Incidence of PCO varies widely; ranging from 15% to 50%. Patients who have PCO with significantly reduced visual acuity need Nd: YAG Laser Capsulotomy in order to improve Vision.

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Neodymium-doped Yttrium Aluminium Garnet (Nd: YAG) Laser Capsulotomy is a relatively non-invasive procedure, Introduced by Dr. Aron-Rosa and Dr. Fankhauser in 1980s [3] . A small circular opening is created in the visual axis by application of quick-pulsed Nd: YAG Laser by Photodisruption mechanism [3]. Although it is considered as relatively safe procedure, yet it is associated with Immediate complications like: Pitting of IOL, Transient rise of Intraocular pressure (IOP), Late complications like Retinal detachment, Cystoid macular edema etc.

Materials And Methods:-

This was a Prospective Interventional study done on 100 eyes of 100 Post Cataract surgery patients who are having PCO attending to OPD of Ophthalmology department, Dr. R.S.P.R Government Regional eye hospital, Andhra Medical College, Visakhapatnam from August 2021 to August 2022 were included. All patients having Posterior Capsular Opacification Post Cataract surgery with significant visual fall were included in this study. Patients with Corneal pathologies like Corneal scars, edema and irregularities, patients with Retinal pathologies like Retinal detachment and Cystoid macular edema were excluded.

Institutional Ethics Committee approval was obtained before the start of the study. Written informed consent was taken from each patient before inclusion into the study. A detailed clinical history pertaining to decreased vision and Cataract surgery was taken. Detailed Ophthalmic examination like visual acuity testing with snellen chart, Examination of Anterior segment of eye with slit lamp biomicroscopy, fundus examination with direct and indirect ophthalmoscopy, measurement of intraocular pressure by Applanation tonometry was done. Posterior capsulotomy was done by using Nd: YAG Laser. Energy of 1-3 mj was used. Number of shots 5 to 6 given. Intraocular pressure is recorded at 2hrs after capsulotomy. After Nd: YAG Laser Capsulotomy, patient was prescribed with topical 0.2% Brimonidine, topical antibiotic and steroid eye drops. Patient was sent home to come for follow up on day1, day 7, 1month.

Results:-

A total of 100 eyes of 100 Post Cataract surgery patients with PCO were included in the study. Majority of the patients are in the age group of 51-60 years (36%) Mean age is 55.6 years. Sex distribution 54% are Males and 46% are Females.

Table 1:- Age Distribution Of PCO.

AGE (IN YEARS)	NO. OF PATIENTS	%
10 - 20	0	0
21-30	3	3
31-40	8	8
41-50	25	25
51-60	36	36
61-70	16	16
>70	12	12
TOTAL	100	100

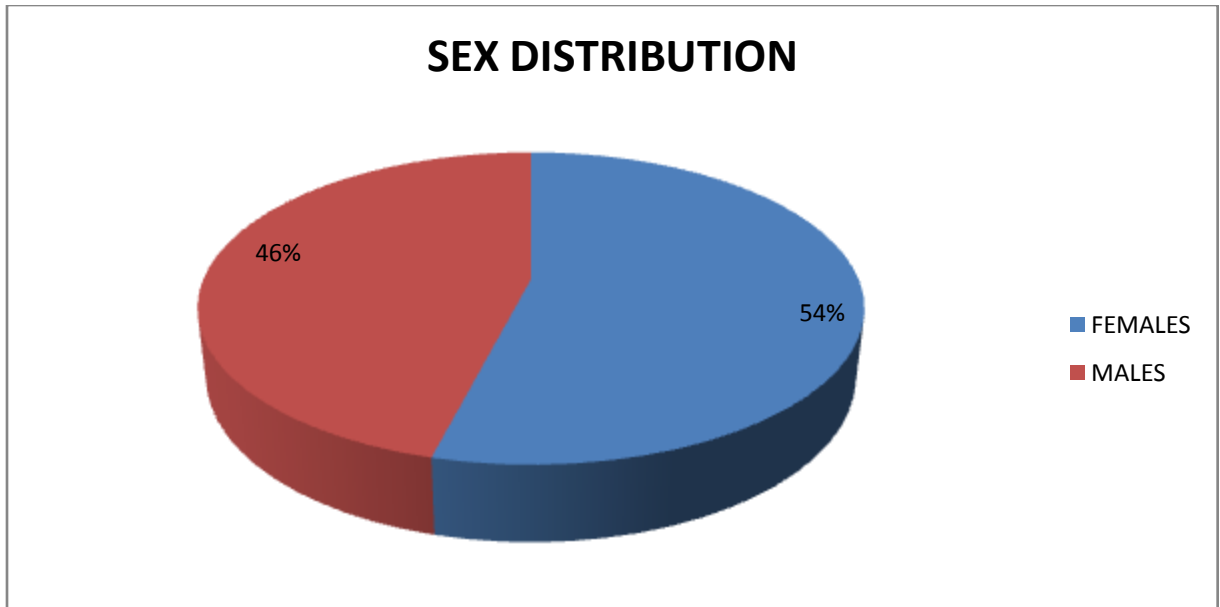


Figure 1:- Pie Diagram Depicting Sex Distribution

Table 2:- Duration From Surgery To Presentation With PCO.

DURATION	CASES	%
3-6 MONTHS	15	15
6MONTHS – 1 YEAR	30	30
1 – 5 YEARS	55	55

Table 3:- Distribution Of Cases According To Type Of PCO.

TYPE	NO. OF CASES	%
FIBROUS TYPE	42	42
ELSCHNIGS PEARL TYPE	36	36
MIXED	22	22
TOTAL	100	100

Table 4:- Distribution Of Cases According To Pre Laser Best Corrected Visual Acuity.

PRE LASER BCVA	NO. OF CASES	%
CF2MTRS TO CF 3MTRS	9	9
CF 3MTRS TO <6/60	58	58
6/36 – 6/24	23	23
6/18 – 6/12	7	7
6/12 – 6/6	3	3
TOTAL	100	100

TABLE 5:- Distribution Of Cases According To Post Laser Best Corrected Visual Acuity.

POST LASER BCVA	NO. OF CASES	%
6/60 TO 6/36	6	6
6/36 TO 6/24	9	9
6/18 TO 6/12	16	16
6/12 TO 6/6	69	69
TOTAL	100	100

TABLE 6:- Mean IOP After Nd Yag Laser Capsulotomy

PRE YAG LASER MEAN IOP	POST YAG LASER MEAN IOP AT 2 HRS	POST YAG LASER MEAN IOP AT DAY 1	POST YAG LASER IOP AT 1 WEEK
14.07 mmHg	16.92 mmHg	15.30 mmHg	14.27 mmHg

Mean IOP is more at 2hrs post Laser treatment.

Table 7:- Distribution Of Cases According To Rise In Iop After 2 Hours.

ELEVATION OF IOP (IN mm Hg)	NO. OF CASES	%
NO ELEVATION IN IOP	26	26
1-5 mmHg	70	70
6-8 mmHg	4	4
TOTAL	100	100

1-5mmHg rise is seen in majority of cases (74%).

Table 8:- Intra And Post Nd: Yag Laser Complications.

S. NO.	COMPLICATIONS	SEEN AT 2 HRS	%	AT THE END OF 1MONTH
1.	ELEVATION OF IOP >4mm Hg	46	46	0
2.	PITTING OF IOL	5	5	0
3.	AQUEOUS FLARE	1	1	0
4.	CYSTOID MACULAR EDEMA	3	3	0

Discussion:-

The Nd: YAG Laser is a solid-state laser with wavelength of 1064nm that can disrupt ocular tissues by the mechanism of Photodisruption. In the present study, most common age group with PCO is 51-60yrs followed by 41-50yrs age group. Females(54%) are predominant when compared to Males(46%). In the present study, the mean duration from Cataract surgery to patient presenting with PCO is 2.2 years, which correlates with MahtabAlamKhanzada et al[5] mean duration is 2.5 years. In a study by Hasan et al [6] mean duration is 2.49 years.

In the present study predominant type is Fibrous type which is 42%, correlates to the study by KhaledaNazneen Bari [7]. In a study by Hasan et al, Elschnigs pearl type is predominantly seen. In the present study, Overall best corrected visual acuity in 85% of the cases is 6/18. In a study by KhaledaNazneen Bari [7] 63.9% showed better vision. In a study by Gore V.S [11] 91.5% showed better vision.

Visual acuity improved to 6/12 to 6/6 in 69% of cases, 6/18 to 6/12 in 16 cases, 6/36 to 6/24 in 9% of cases, 6/60 in 6% of cases.

In the present study, no elevation of IOP seen in 26% cases, 1-5mm Hg elevation of IOP seen in 70% cases, 6-8 mmHg rise elevation seen in 4% cases. IOP in all cases of our study, returned to baseline level after one week of treatment with topical Brimonidine. Persistent rise in IOP has not been observed in the present study. A study by Hasan K.S. et al states that 23.25% cases showed a significant rise of intraocular pressure of more than 5mmHg. A study by Mohammad.L et al [8], rise of IOP is seen in 10% cases.

In the present study Pitting of IOL is seen in 5% cases. In a study by MahtabAlamKhanzada et al [5] where IOL damage is seen in 9.37% cases. In Bilal Khan et al [9] IOL Pitting was the most common complication seen in 12.81% cases. In the present study Cystoid macular edema seen in 3% cases similar to the study by Bilal Khan et al [9] observed in 3.89% cases.

Conclusion:-

Visual recovery after Nd: YAG Laser Capsulotomy is remarkable. It is more than 6/18 in 85% of the cases. Only in 15% of the cases BCVA is low. Transient rise of IOP is the most common complication. Even though transient, it may be detrimental to the health of the Optic nerve head. So a careful monitoring of IOP before and after

Nd:YAG Laser Capsulotomy is very much needed. To prevent avoidable complications like Pitting of IOL care should be taken while focussing the laser beam while doing Capsulotomy. Overall results of Nd: YAG Laser Capsulotomy are associated with good visual outcome with less post Laser complications.

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